This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently Amended). A current regulator for a regulated superconducting logic device with an on-board current regulator adapted to be powered by an external power supply, the current ~~regulator~~ regulated superconducting logic device comprising:

a non hysteretic Josephson junction coupled between said external power supply and a node;

a hysteretic Josephson junction coupled between said node and ground; and

a biasing resistor coupled ~~on one end~~ to said node and ~~adapted to be connected on the other end to~~ said superconducting logic device.

2. (Original). The current regulator as recited in claim 1, wherein said non hysteretic junction includes a hysteretic Josephson junction coupled in parallel with a resistor forming a resistively shunted junction (RSJ).

3. (Original). The current regulator as recited in claim 1, wherein said non-hysteretic junction is a self shunting junction.

4. (Original). The current regulator as recited in claim 1, wherein said biasing resistor is a thin film resistor.

5. (Currently Amended). A current regulator for a superconductivity logic device adapted to be powered by an external power supply, the current regulator comprising:

a current limiting resistor coupled between said external power supply and a first node;

a hysteretic Josephson junction coupled between said node and ground;

a first non hysteretic junction coupled between said first node and a second node; and

a damping impedance coupled between said second node and ~~said~~ a superconducting logic device.

6. (Original). The current regulator as recited in claim 5, wherein said non-hysteretic junction includes a hysteretic junction coupled in parallel to a resistor forming a resistively shunted junction (RSJ).

7. (Original). The current regulator as recited in claim 5, wherein said non-hysteretic junction is a self shunting junction.

8. (Original). The current regulator as recited in claim 5, wherein said damping impedance includes a series inductance.

9. (Original). The current regulator as recited in claim 5, wherein said damping impedance includes a shunt capacitance.

10. (Original). The current regulator as recited in claim 5, wherein said damping impedance includes a resistance.

11. (Original). The current regulator as recited in claim 5, wherein said damping impedance includes a low pass filter.

12. (Original). The current regulator as recited in claim 5, further including one or more additional non-hysteretic junctions serially coupled to said first non-hysteretic junction between said first node and said second node.

13. (Currently Amended). A current regulator for a superconducting logic device adapted to be powered by an external power supply, the current regulator comprising:

a non hysteretic junction coupled between said external power supply and ~~said~~ a node; and

a damping impedance in series with said non hysteretic junction and coupled between said node and said superconducting logic device.

14. (Original). The current regulator as recited in claim 13, wherein said non-hysteretic junction includes a hysteretic Josephson junction coupled in parallel to a resistor forming a resistively shunted junction (RSJ).

15. (Original). The current regulator as recited in claim 13, wherein said non-hysteretic junction is a self-shunting junction.

16. (Original). The current regulator as recited in claim 13, wherein said damping impedance includes a series inductance.

17. (Currently Amended). ~~The~~ A current regulator ~~as recited in claim 13,~~ for a superconducting logic device adapted to be powered by an external power supply, the current regulator comprising:

a non hysteretic junction coupled between said external power supply and said node; and

a damping impedance coupled between node and said superconducting logic device,

wherein said damping impedance includes a shunt capacitance.

18. (Original). The current regulator as recited in claim 13, wherein said damping impedance includes a resistance.

19. (Currently Amended). ~~The~~ A current regulator ~~as recited in claim 13,~~ for a superconducting logic device adapted to be powered by an external power supply, the current regulator comprising:

a non hysteretic junction coupled between said external power supply and said node; and

a damping impedance coupled between said node and said superconducting logic device,

wherein said damping impedance includes a low pass filter.

20. (Original). The current regulator as recited in claim 14, wherein said resistor is a thin film resistor.